REMARKS

Claims 1-7, 9-13, 15-20 and 22 are currently pending in this application. Applicants have amended claims 11 and 12 to recite dependency upon claim 1, as opposed to cancelled claim 8. In addition, Applicants have amended the independent claims 1, 13 and 17 to correct antecedent issues pointed out by the Examiner. The Examiner is thanked for pointing out these informalities.

Rejections under 35 U.S.C.

Claims 1-4, 6-7, 9, 13-20 and 22 are rejected under 35 U.S.C. §103 as being unpatentable over Deering , S.: "Multicast routing internetworks and extended LANs " in view of Shah "Performance under a failure of Wide-Area datagrams network with unicast and multicast traffic routing."

Claim 1, as amended, now recites "...receiving link state advertisements from routers in a network; and constructing a multicast routing table and a unicast routing table from the received link state packets, the multicast routing table corresponding to a short path tree through multicast routers, wherein the multicast routing table includes a plurality of routing entries, and *wherein routing entries are placed in the multicast routing table only for link state advertisements having a multicast capable bit set indicating that the associated router is a multicast router ;* and routing multicast packets using the multicast routing table, and unicast packets using the unicast routing table ..."

In contrast, Shah describes, at page 3, paragraph 4:

"... The multicast routing component has different routing tables for unicast and multicast traffic. Based on the global topology table, each component creates its own adjacency matrix which gives the cost to go from node i to node j for all node pairs (i,j); the cost is infinite if node j is not directly reachable from node i. Based on this adjacency matrix, the MSPF component creates a unicast routing table... The multicast routing component extracts the next hops for all destinations from the node it is connected to and stores them (the link towards the next hop) in the unicast routing table...The multicast routing table ... (is generated using)... the adjacency matrix and the global connection table,.. If any destination is not directly reachable from a particular source, then it uses the next hop stored in the unicast routing table..."

Such a mechanism as described in Shah, which builds both unicast and multicast tables from a common database (i.e., the global topology table and adjacency matrix), is different that that claimed in the present invention, where each routing table is built using different information (as recited in claim 1, "wherein the multicast 'routing entries are placed in the multicast routing table only for link state advertisements having a multicast capable bit set...")

In Deering, section 4 addresses the integration of multicast and unicast within a system. Deering states, at page 92, paragraph 4 "... Typical learning bridges maintain a table of unicast addresses... To support multicasting, the table must also hold multicast addresses. " However, no teaching or suggestion is found in Deering of "*...wherein routing entries are placed in the multicast routing table only for link state advertisements having a multicast capable bit set indicating that the associated router is a multicast router...*" as recited in amended claim 1.

Accordingly, for at least the reason that the combination of Deering and Shah neither describe nor suggest "... wherein routing entries are placed in the multicast routing table only for

link state advertisements having a multicast capable bit set..." claim 1 is patentably distinct over the combination and the rejection is overcome.

Independent claims 13 and 17 have been amended to include the limitation of claim 1, and are therefore patentably distinct over the combination of Shah and Deering for at least the reasons described above. Dependent claims 2-7, 9-12, 14-16 and 17-20, 22 serve to further limit their allowable patent claims, and are therefore allowable for at least the reasons put forth above with regard to their parent independent claims.

Claims 5 and 10-12 were rejected under 35 U.S.C. §103 as being unpatentable over Shah in view of Deering and further in view of Haggerty U.S. Patent No. 6,331,983.

Haggerty describes a method wherein a source receives a multicast packet on an access port, determines a group address of the packet and composes and sends a 'sender present' to other switches in the network. The receiving switches determine whether a local host wishes to join the group and, if so, send a map message back to the source switch. A map message may terminate at a switch on the path that already has a connection for the source/group pair and join into this connection as an additional output port. In this manner, a "signal out, connect back" method is provided for establishing a connection path from the sender to multiple receivers. (Abstract). Haggerty is particularly directed to a multicast environment, and is silent as to how the two environments operate together.

The examiner relies on Haggerty as teaching the limitation of PIM, although it unclear to Applicant why claim 5 is rejected in this grouping. However, despite any mention of PIM in Haggerty, Haggerty does nothing to overcome the base deficiencies of Shah and Deering in

teaching the limitations of the parent independent claims. Accordingly, for at least this reason, the rejection is overcome and should be withdrawn.

Applicants have made a diligent effort to place the claims in condition for allowance. However, should there remain unresolved issues that require adverse action, it is respectfully requested that the Examiner telephone Lindsay McGuinness, Applicants' Attorney at 978-264-6664 so that such issues may be resolved as expeditiously as possible.

For these reasons, and in view of the above amendments, this application is now considered to be in condition for allowance and such action is earnestly solicited.

Respectfully Submitted,

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1. (Currently Amended) A method of multicast routing, comprising:

receiving link state advertisements from routers in a network; and

constructing a multicast routing table and a unicast routing table from the received link state packets, ~~and~~ the multicast routing table ~~tables~~ corresponding to a short path tree through multicast routers, wherein the multicast routing table includes a plurality of routing entries, and wherein routing entries are placed in the multicast routing table only for link state advertisements having a multicast capable bit set indicating that the associated router is a multicast router.

2. (Currently amended) The method of claim 1, wherein the step of routing multicast packets further comprising performing reverse path forwarding using the multicast routing table.

3. (Original) The method of claim 1 wherein the link state advertisements comprise OSPF (Open Short Path First) link state advertisements.

4. (Original) The method of claim 1 wherein the link state advertisements comprise MOSPF (Multicast Open Short Path First) link state advertisements.

5. (Original) The method of claim 1 wherein constructing the multicast routing table comprises determining if a router is a multicast router.

6. (Original) The method of claim 1 wherein constructing the multicast routing table comprises using Dijkstra's short path algorithm.

7. The method of claim 1 wherein the multicast routing table correlates addresses of destination multicast capable routers with addresses of multicast capable routers on a short path tree of multicast capable routers.

8. (Cancelled)

9. (Original) The method of claim 1 wherein using the multicast routing table comprises configuring PIM (Protocol Independent Multicasting) to use the multicast routing table.

10. (Original) The method of claim 9 wherein configuring comprises providing a routine for a PIM RPF_Check function.

11. (Currently amended) The method of claim ~~8~~ 1 wherein PIM uses the multicast routing table to perform reverse path forwarding in sparse mode.

12. (Currently amended) The method of claim ~~8~~-1, wherein PIM uses the multicast routing table to perform reverse path forwarding in dense mode.

13. (Previously Amended) A method of multicast routing, comprising:

receiving MOSPF (Multicast Open Short Path First) link state advertisements from routers in a network;

constructing a multicast routing table and a unicast routing table from the received link state packets, the multicast routing table correlating addresses of destination multicast capable routers with addresses of multicast capable routers on a short path tree of multicast capable routers, wherein the multicast routing table includes a plurality of routing entries, and wherein routing entries are placed in the multicast routing table only for link state advertisements having a multicast capable bit set indicating that the associated router is a multicast router; and

performing reverse path forwarding using the multicast routing table upon receipt of a multicast packet.

14. (Cancelled)

15. (Currently amended) The method of claim 13 wherein multicast routing ~~comprising~~ comprises routing in accordance with the Protocol Independent Multicasting (PIM) protocol.

16. (Currently amended) The method of claim 13 wherein multicast routing comprises ~~comprising~~ routing in accordance with the Protocol Independent Multicasting (PIM) protocol.

17. (Currently Amended) A computer program product, disposed on a computer readable medium, for multicast routing, the computer program including instructions for causing a computer to:

receive link state advertisements from routers in a network; and to

construct a multicast routing table and a unicast routing table from the received link state packets, the tables corresponding to a short path tree through multicast routers, wherein the multicast routing table includes a plurality of routing entries, and wherein routing entries are placed in the multicast routing table by the computer program product only for link state advertisements having a multicast capable bit set in the link state advertisement indicating that the associated router is a multicast router.

18. (Original) The computer program of claim 17 further comprising instructions for performing reverse path forwarding using the multicast routing table.

19. (Original) The computer program of claim 17 wherein the link state advertisements comprise MOFPF (Multicast Open Short Path First) link state advertisements.

20. (Original) The computer program of claim 17 wherein the multicast routing table correlates addresses of destination multicast capable routers with addresses of multicast capable routers on a short path tree of multicast capable routers.

21. (Cancelled)

22. (Original) The computer program of claim 17 wherein multicast routing comprises multicast routing using the Protocol Independent Multicasting (PIM) protocol.